3RD INTERNATIONAL ARA DAYS
2011, May 2-4 – Arcachon – France

GENERAL LOCATION
Palais des Congrès d'Arcachon Boulevard Veyrier Montagnères
33120 Arcachon – FRANCE
(3/4 hour drive from Bordeaux International Airport)

LANGUAGE
Papers will be presented in English. Simultaneous translation facilities will not be available.

SECRETARIAT
All correspondance and inquiries should be sent to the conference secretariat.

Avantage Aquitaine – 42, rue de Tauzia 33800 Bordeaux – France
Tel/voice box: + 33 (0)6 81 42 23 95
Fax: +33 (0)1 45 31 61 34 – E-mail: jfb@avantage-aquitaine.com

Image : Feno + 33 (0)6 07 95 87 59 • Conception graphique : Sophie Bougnon + 33 (0)1 58 30 70 52

THE ATMOSPHERIC REENTRY ASSOCIATION

Presents the

3RD INTERNATIONAL ARA DAYS

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PRELIMINARY PROGRAMME

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Dear Madam, Dear Sir, Dear Professionals of Atmospheric Reentry,

2 1/2 years after our celebration of the 10th anniversary of the Atmospheric Reentry Demonstrator capsule premiere flight, the Atmospheric Reentry Association is pleased to convene you again for a new edition of your traditional rendez-vous.
The conference will once again bring together the Atmospheric Reentry Community in the usual friendly way, scientists from the academic world and industry, students, research and development engineers, management delegates from prime contractors and suppliers companies, agencies representatives, end users representatives.
12 to 18 months prior to an European Space Agency Council at Ministerial level, the symposium will give the opportunity to exchange on the latest developments and perspectives dealing with atmospheric reentry.
A special emphasis is given to the evolution of ESA initiative for an Advanced Reentry Vehicle servicing the International Space Station, and also the latest developments of ESA EXPERT programme, ESA IXV project, DLR SHEFEX project, CIRA USV initiative and flight tests, European Union contracts.

Progress and perspectives are illustrated through programmes plenary sessions, and also through the wide field of technical sessions that will address :

- *Mission analysis*
- *Aerodynamics & aerothermics, computational fluid dynamics*
- *Guidance, navigation and flight control*
- *Thermal protection systems design & manufacturing*
- *Vehicles assembly, integration and testing*
- *Flight test instrumentation*
- *Descent & landing systems*

I would like to thank all authors who committed themselves to provide communications at the conference, thus contributing to generation of fruitful exchanges and cross-fertilization amongst all participants.
I am looking forward to meeting you again in a sunny Arcachon, and meanwhile I thank you in advance to widely distribute this Programme amongst your organizations and partners.

Yours faithfully,

Thierry Leveugle
President, The Atmospheric Reentry Association
Vice-President, Research & Technology, Astrium Space Transportation, an EADS Company.

Programme

Monday May 2nd, 2011

08h30-09h00	REGISTRATION	
	INTRODUCTION KEYNOTE	
09h00-09h30	• Special ESA Keynote Marco CAPORICCI, ESA/ESTEC	
	PLENARY SESSION	
09h30-10h00	• DLR's Re-Entry Programme: SHEFEX and REX Free Flyer Hendrick WEIHS, DLR (Germany)	
10h00-10h30	COFFEE BREAK	
	PLENARY SESSION	
10h30-11h00	• Expert Status – José GAVIRA, ESA/ESTEC	
11h00-11h30	• The Advanced Re-entry Vehicle (ARV) – Development Step From ATV Towards Manned Transportation Systems – Philppe BERTHE, ESA/ESTEC	
11h30-12h00	• USV Programme Progress and Perspectives Gennaro RUSSO, CIRA (Italy)	
12h00-12h30	• Debris Re-entry Modelling Hélène DUONG, ASTRIUM Space Transportation (France)	
12h30-14h00	LUNCH	
	AERODYNAMICS AEROTHERMICS - CFD	**GNC AND FLIGHT CONTROL -1**
14h00-14h20	• Numerical Simulations of Flows Past IXV Re-entry Vehicle at CRAS Renato PACIORRI, Centro Ricerche Aerospaziali Sapienza (Italy)	• Reentry Flight-control Design by a New Dynamic Inversion Based Approach – Jean-Marc BIANNIC, Onera (France)
14h20- 14h40	• Numerical Simulation of Hypersonic Rarefied Flows – Céline BARANGER, CEA / CESTA (France)	• Flying Qualities Analysis Framework for Re-entry Vehicles – Rodrigo HAYA RAMOS, DEIMOS Space S.L.U. (Spain)
14h40-15h00	• Accurate Interpolation of State Surfaces for Thermodynamic Properties of Equilibrium Carbon Dioxide – Nitrogen Atmospheres and their Implementation in a Coupled Euler – Boundary Layer Method Martin STARKLOFF, University of the Federal Armed Forces (Germany)	• High Yield Solid Propulsion Reaction Control System for Space Plane Stéphane Henry, SNPE/SME (France)
15h00-15h20	• Modeling of the Interaction between a Turbulent Flow and an Ablatable Material Thibault HARRIBEY, CEA/CESTA (France)	• A Control System Rapid Prototyping Implementation for RLV Technology Demonstrators Giovanni CUCINIELLO, CIRA (Italy)

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	AERODYNAMICS AEROTHERMICS - CFD	GNC AND FLIGHT CONTROL -1
15h20-15h40	• Navier-Stokes Solutions with Surface Ablation under Reentry Conditions – Daniele BIANCHI, Sapienza University of Rome (Italy)	• Planetary Reentry Capsule Stabilization – Jean-Marc BOUILLY, ASTRIUM Space Transportation (France)
15h40-16h00	• Experimental Investigation of Aero-thermal Characteristics of the IXV Hypersonic Vehicle in the VHI-longshot and Numerical Rebuilding Sébastien PARIS, VKI (Belgium)	• IXV GNC Design, Development and Verification Daniele GHERARDI, SENER Ingeniería y Sistemas S.A. (Spain)
16h00-16h30	COFFEE BREAK	
	TPS - 1	**GNC AND FLIGHT CONTROL - 2**
16h30-16h50	• SPFI an Oxide Ceramic windward-side TPS – Recent Developments Wolfgang P.P.FISCHER, ASTRIUM Space Transportation GmbH (Germany)	• Blast Mission Analysis, Flight Mechanics and GNC Davide BONETTI, DEIMOS Space S.L.U. (Spain)
16h50-17h10	• ASTERM : a New Low Density Ablative Material Jean-Marc BOUILLY, ASTRIUM Space Transportation (France)	• GNC FDI/FTC Technology For Re-entry Vehicles Luis Felipe PEÑIN, DEIMOS Space S.L.U. (Spain)
17h10-17h30	• New FP7 Project on Multifunctional Reusable Components for Atmospheric Re-entry "SMARTEES": Project Kick-off – Jorge BARCENA, TECNALIA-Aerospace (Spain)	• Experimental Determination of the Dynamic Derivatives of Reentry Capsule in Transonic Supersonic Regime – Sébastien PARIS, VKI (Belgium)
17h30-17h50	• Advanced Structural Assembly – ASA – Roberto VIOTTO, Thales Alenia Space (Italy)	
19h30	CONFERENCE DINNER	

Tuesday May 3rd, 2011

PLENARY INTRODUCTION SESSION

9h00-9h30	• EXPERT - Project Status and System Overview Federico MASSOBRIO, Thales Alenia Space (Italy)
9h30-10h00	• AEROFAST (AEROcapture for Future spAce tranSporTation) Thierry SALMON, ASTRIUM Space Transportation (France)
10h00-10h30	• Advanced Re-entry Vehicle (ARV) - Mission and Design of the Re-entry Module – Xavier VO, ASTRIUM Space Transportation (Germany)
10h30-11h00	COFFEE BREAK

	TPS - 2	GNC AND FLIGHT CONTROL 3
11h00-11h20	• Development and Industrialisation of C-SiC Thermal Protection Systems for IXV – René BARRETEAU SNECMA Propulsion Solide (France)	• IXV Re-entry GNC Design and Performance Luis Felipe PEÑIN, DEIMOS Space S.L.U. (Spain)
11h20- 11h40	• Thermal Analysis in Support to TPS Seals and Interface Design of IXV Maria Teresa SIGNORELLI, Thales Alenia Space Italia (Italy)	• ARV – Flying Qualities Analysis and Preliminary Control Needs Assessment – Frederic PELLET, ASTRIUM Space Transport. (France)
11h40-12h00	• Windward and Nose Assemblies CMC Thermal Protection Systems for the IXV Re-entry Demonstrator - Technological and Development Tests – François-Laurent BUFFENOIR, SNECMA Propulsion Solide (France)	• IXV Flap Performance Analysis Francesco CATTONI, ALTRAN (Italy)
12h00-12h20	• AEROFAST: Development of Innovative Thermal Protections Jean-Marc BOUILLY, ASTRIUM Space Transportation (France)	• AEROFAST Project: Aerocapture GNC Design and Performance – Philippe VERNIS, ASTRIUM Space Transportation (France)
12h20-14h00	LUNCH	

PLENARY SESSION

	MISSION ANALYSIS
14h00-14h20	• Flight Mechanics Aspects of EXPERT Re-entry Vehicle Martins SUDARS, Thales Alenia Space (Italy)
14h20-14h40	• Advanced Re-entry Vehicle (ARV) Mission Analysis – Focus on Re-entry Phases and Related Sizing Issues Adrien CHAPELLE, ASTRIUM Space Transportation (France)
14h40-15h00	• Aerodynamic and Aerothermodynamic Trade-off Analysis of the Italian USV2 Flying Test Bed in the Framework of an Hypersonic Flight Test – Giuseppe PEZZELA, CIRA (Italy)

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Tuesday May 3rd, 2011

	MISSION ANALYSIS	
15h00-15h20	• Mission Analysis and Flight Mecanics of the IXV Mission Rodrigo HAYA RAMOS, DEIMOS Space S.L.U. (Spain)	
15h20-15h40	• The IXV System: From Design To Development Roberto ANGELINI, Thales Alenia Space (Italy)	
15h40-16h00	• CubeSats for Key Debris Mitigation Technology Demonstration to be Launched Together with the QB50 Network Jean MUYLAERT, VKI (Belgium)	
16h00-16h30	COFFEE BREAK	
	TPS - 3	**DESCENT AND LANDING SYSTEMS**
16h30-16h50	• CMC Thermal Protection Systems for the Intermediate eXperimental Vehicle (IXV). From Elementary Samples to Full Scale Sub-systems... And Future Perspectives Thierry PICHON, SNECMA Propulsion Solide (France)	• Aerodynamic Aspects for an Auto-rotation Based System for Entry, Descent and Landing on Mars Peter NÖDING, ASTRIUM Space Transportation (Germany)
16h50-17h10	• TPS Design, Development and Verification Approach for IXV Program – Helena BRACH PREVER, Thales Alenia Space Italia (Italy)	• IXV Water Landing Simulation and Scaled Model Splashdown Tests Valerio BECCHIO, Thales Alenia Space (Italy)
17h10-17h30	• RASTAS SPEAR : Radiation-Shapes-Thermal Protection Investigations for High Speed Earth Re-entry Jean-Marc BOUILLY, ASTRIUM Space Transportation (France)	• MHD Parachute Concept For Reentry Mission Valentin BITYURIN, Joint Institute for High Temperatures of Russian Academy of Sciences (Russia)

Wednesday May 4th, 2011

	FLIGHT TEST INSTRUMENTATION	AIT
09h30-09h50	• Instrumentation of the IXV to Measure TPS Performance and Aero-thermodynamic Phenomena during Atmospheric Re-entry Carlos PEREIRA, RUAG Space (Switzerland)	• Development of Metallic Thermal Protection System for the EXPERT Re-entry Vehicle Javad FATEMI, Dutch Space B.V. (The Netherlands)
09h50-10h10	• Reentry Black Box Antonio AYUSO, SENER Ingeniería y Sistemas (Spain)	• Intermediate eXperimental Vehicle (IXV) Re-entry Demonstrator - Optimized Assembly, Integration and Test Approach – Vittorio ANCONA, Thales Alenia Space (Italy)
10h10-10h30	• The Ground Segment of the Intermediate eXperimental Vehicle (IXV) – Gianfranco SANTORO, Thales Alenia Space (Italy)	• The IXV System : Entering into the H/W Phase – Enrico ANGELINO, Alenia Space (Italy)
10h30-11h00	COFFEE BREAK	
	PLENARY SESSION	
	FLIGHT TESTS	
11h00-11h30	• Sounding Hypersonic Atmospheric Reentry Capsule SHARK. Design Realization Flight and Data Interpretation Roberto GUARDI, CIRA (Italy)	
11h30-12h00	• Flight Testing of Wide Band Spectrometer Dominique PIROTAIS, CEA/CESTA (France)	
12h00-12h30	• First Flight of the SpaceX Dragon Spacecraft Entry Descent & Landing System (EDLS) Jean-François VERGNOLLE, JFV Euro-AeroSpace Consulting (France)	
	CLOSING SESSION	
12h30-12h45	"Conclusions and Perspectives" Thierry LEVEUGLE, ASTRIUM Space Transportation (France)	
12h45-14h15	FAREWELL LUNCH	